

Briefing Space Weather - 2021/11/29

Sun

Responsible: José R. Cecatto

11/22 – Fast (≤ 600 km/s) wind stream; 4 CME can have a component toward the Earth;

11/23 – Fast (≤ 550 km/s) wind stream; 1 CME toward the Earth; SB- Arrival Nov/28 at 06:00Z (glancing blow);

11/24 – Fast (≤ 500 km/s) wind stream; 1 halo CME toward the Earth; SB- Arrival Nov/27 at 13:24Z

11/25 – Fast (≤ 500 km/s) wind stream; 3 CME can have a component toward the Earth;

11/26 – No fast wind stream; 2 CME can have a component toward the Earth; SB- Arrival Nov/29 at 11:00Z (glancing blow);

11/27 – No fast wind stream; No CME toward the Earth;

11/28 – No fast wind stream; No CME toward the Earth;

11/29 – No fast wind stream; 1 CME toward the Earth; SB- Exp. Arrival Dec/02 at 10:55 Z

Prev.: Fast wind expected on December 01-02; very low (5% M, 1% X) flare probability for next 2 days; occasionally other CME(s) can present a component toward the Earth;

Responsible: Douglas Silva

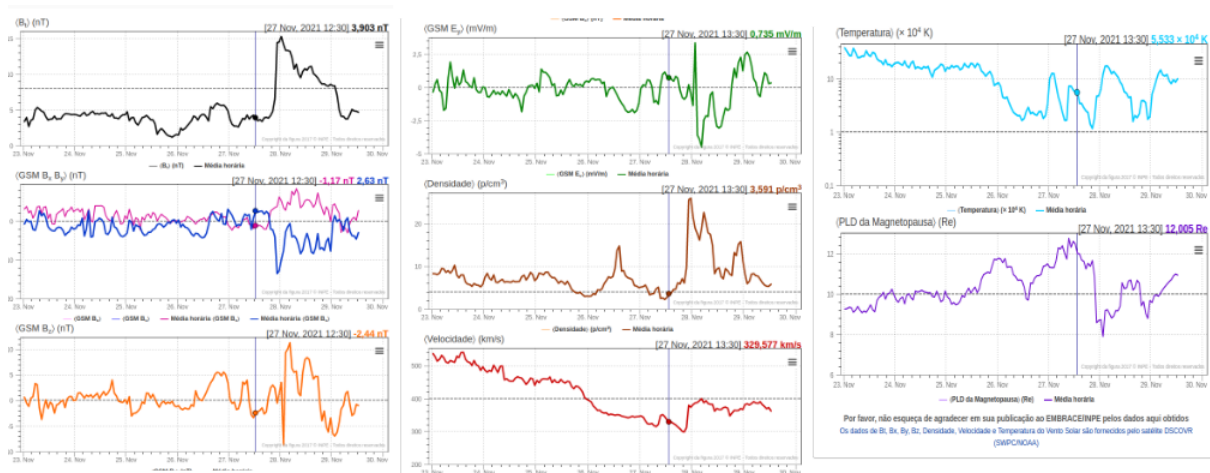
- CME:
 - Type II CME halo was observed around 14:12 UT on November 24 in LASCO imagery.
- WSA-ENLIL (CME 2021-11-24T14:09 UT)
 - The simulation indicates that the CME arrival forecast will occur on the following date:

2021-11-27T13:24Z (-7.0h, +7.0h).

- WSA-ENLIL (Prediction for CME 2021-11-26T01:25 UT)
 - The simulation indicates that the CME arrival forecast will occur on the following date:
2021-11-29T11:00Z (-7.0h, +7.0h).
- Coronal holes (SPOCA):
 - Coronal hole 34696 was identified and observed using the SPOCA between the 22nd and 24th of November
 - Coronal hole 34674 was observed throughout the 22nd of November.
 - Coronal hole 34674 was identified and observed using the SPOCA between the 23rd and 26th of November.

Interplanetary Medium

Responsible: Paulo Jauer

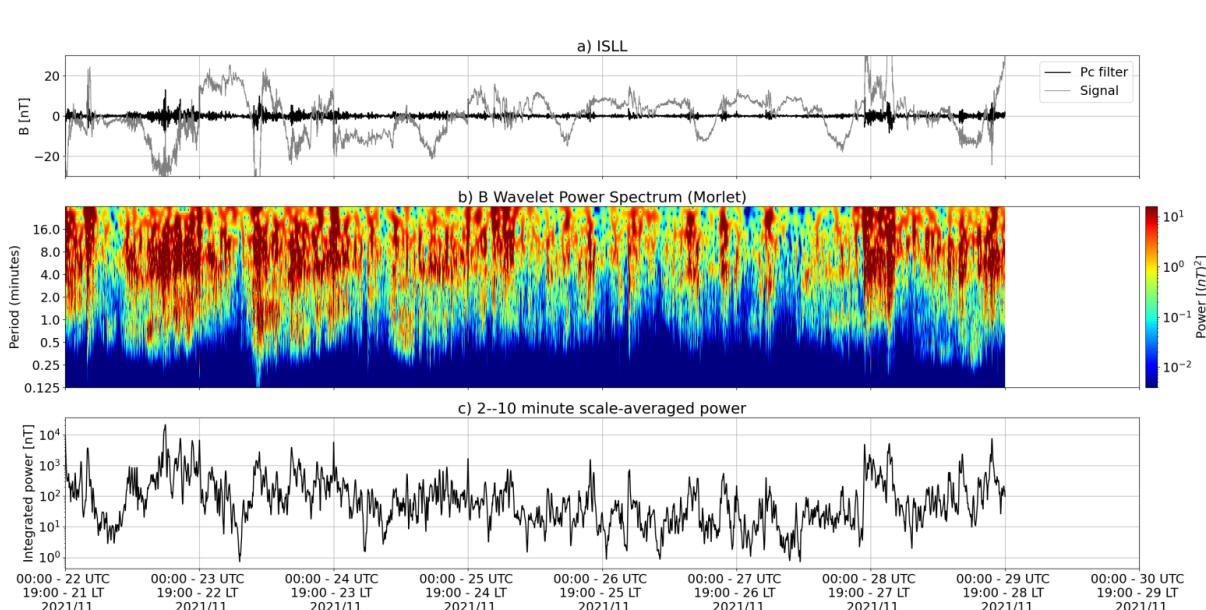


- The interplanetary region in the last week showed a moderate/low level of plasma perturbations due to the passage of the CME and HSS structures identified by the DISCOVERY satellite in the interplanetary region along with sector boundary crossing.
- The total Bt magnetic field oscillated, remaining below 10 nT for most of the period, peaking on Nov 28 at 00:30 15.28 nT.

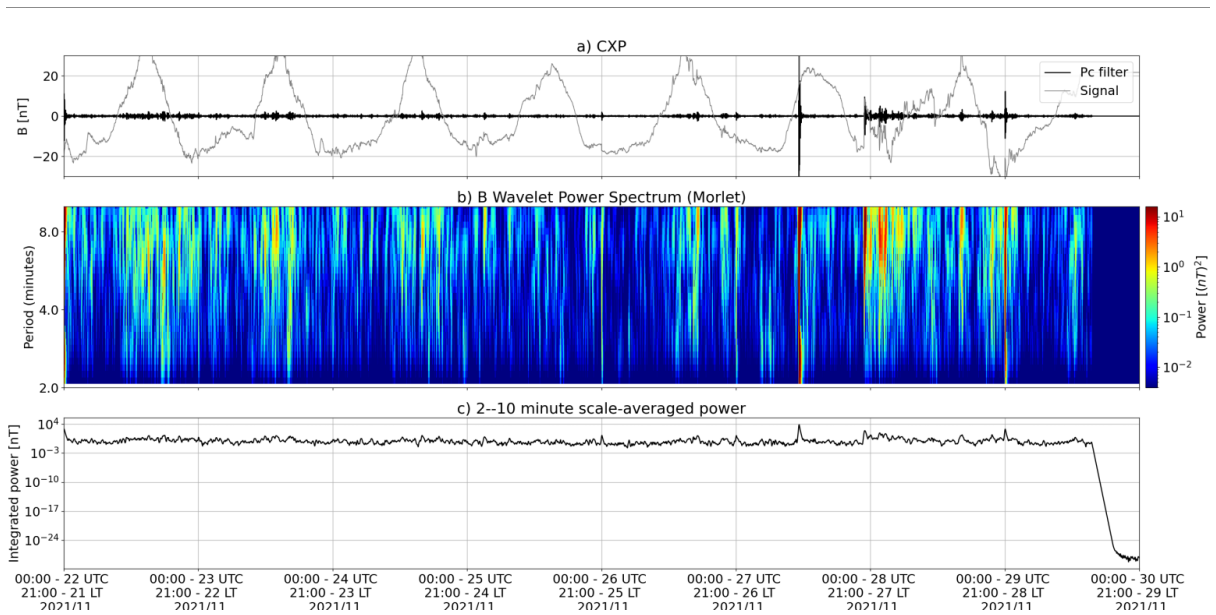
- The IMF Bz component oscillated with 2 peaks on Nov 28 at 01:30 and 04:30 UT of -8.6nT and 11.2nT respectively. It also had a second peak on 29/Nov at 01:30 from -6.9nT.
- There was a clear occurrence of sector switching in the BxBy components, on the 27/Nov at 18:30 with a maximum peak of -13.54 nT in the by component on the 27/Nov at 22:30 UT.
- The Vsw density presented oscillations presenting 3 peaks on the 26th, 27th, 28th of November at 14:30, 23:30 and at 22:30 of 14.7, 25.89 and 15.7 p/cm³.
- The solar wind speed Vsw remained above 400km until 25/Nov, probable presence of shock detected on 27/Nov at 20:30.
- The subsolar Mp showed maximum compression on Nov 28 at 01:30 of 7.89 Re and maximum expansion on Nov 27 at 09:30 12.7 Re.

ULF waves in the Magnetosphere

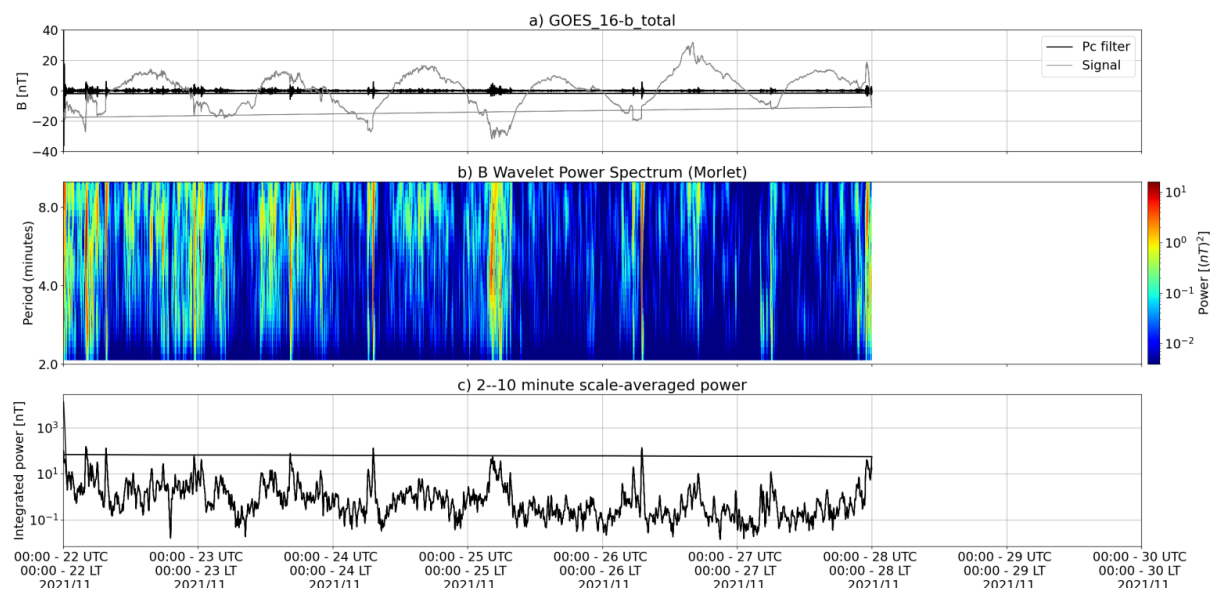
Responsible: José Paulo Marchezi



a) signal of the total magnetic field measured in the ISLL Station of the CARISMA network in gray, together with the fluctuation in the range of Pc5 in black. b) Wavelet power spectrum of the filtered signal. c) Average spectral power in the ranges from 2 to 10 minutes (ULF waves).



a) signal of the total magnetic field measured in the CXP Station of the EMBRACE network in gray, together with the fluctuation in the range of Pc5 in black. b) Wavelet power spectrum of the filtered signal. c) Average spectral power in the ranges from 2 to 10 minutes (ULF waves).



a) signal of the total magnetic field measured by the GOES 16 satellite, together with the fluctuation in the range of Pc5 in black. b) Wavelet power spectrum of the filtered signal. c) Average spectral power in the ranges from 2 to 10 minutes (ULF waves).

The week starts with high and continuous ULF wave activity from November 22 to 25th, from high latitudes (ISLL Station) to low latitudes (CXP). There is a abrupt

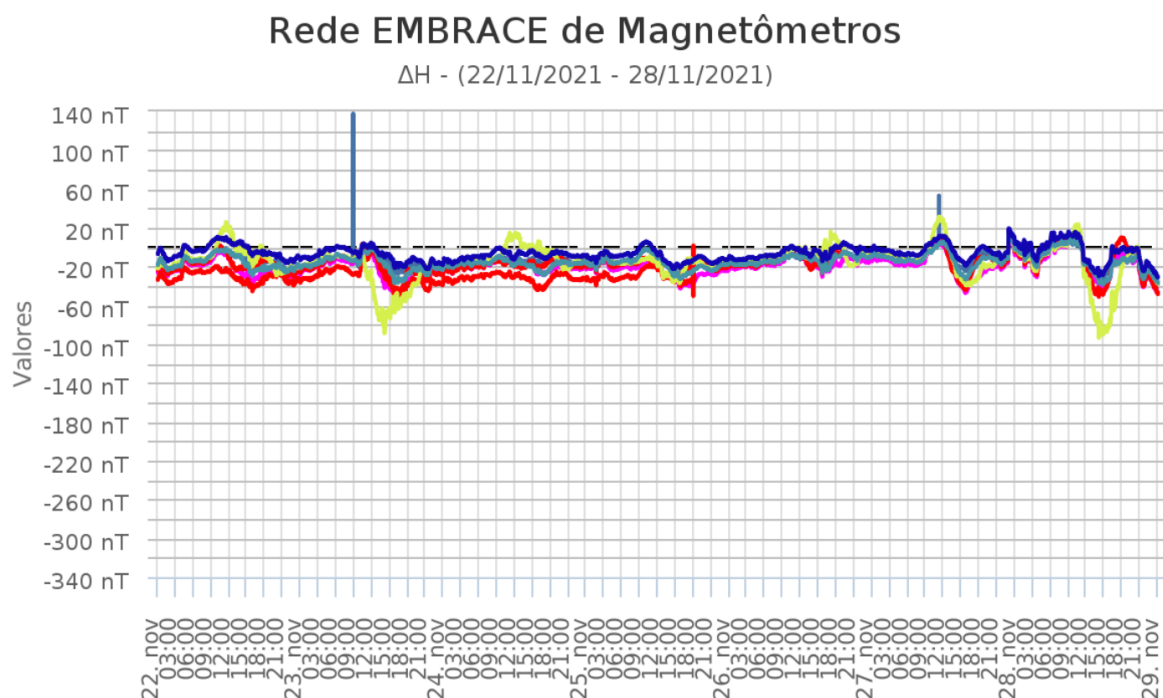
wave signal at the end of 27th and beginning 28th November, probably related to a Coronal Mass ejection interacting with earth. There is a possibility of high auroral activity on 23 to 25 November and 29th.

Geomagnetism

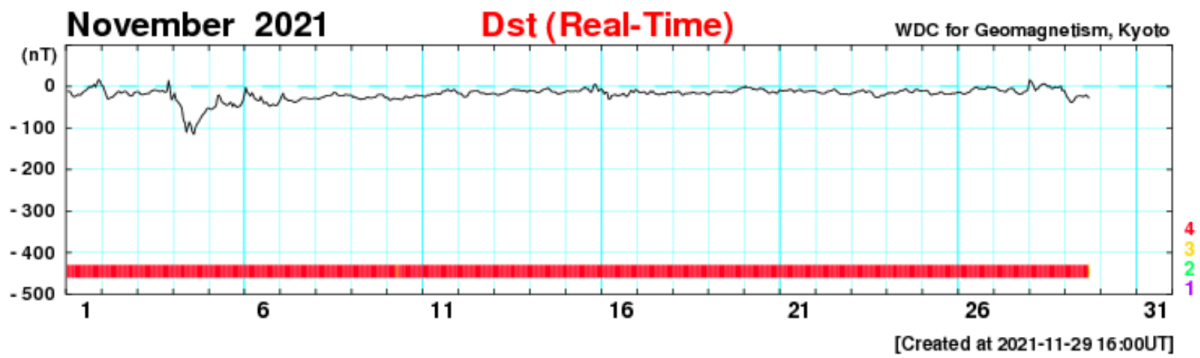
Responsible 29/11: José Paulo Marchezi

In the week of November 22nd to 29th, the following events related to geomagnetic activity stand out:

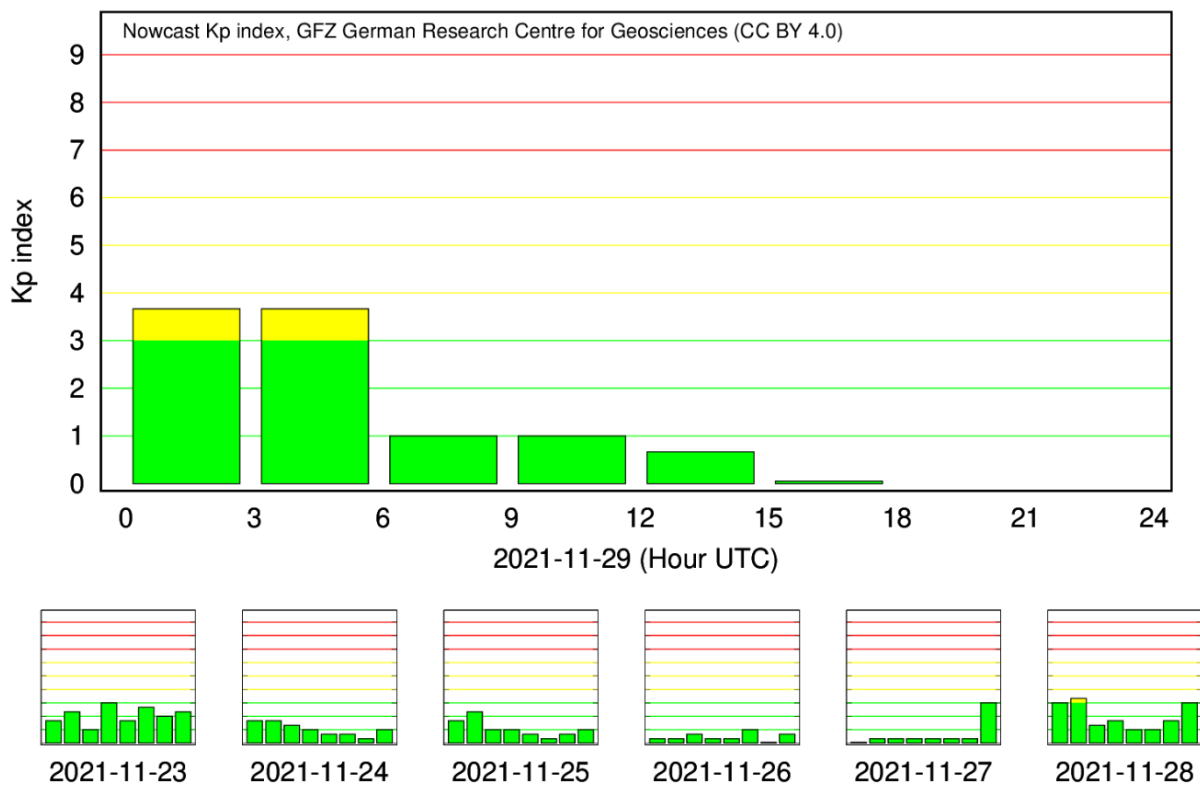
- Data from the Embrace magnetometer network do not show significant variations. Just a slight reduction in magnitude on 11/28.



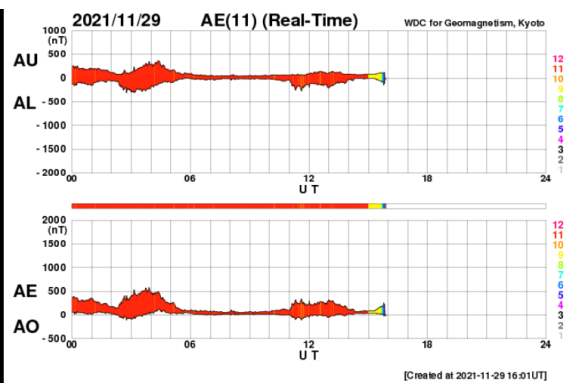
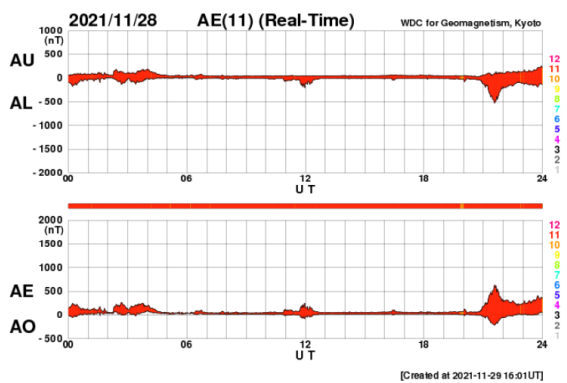
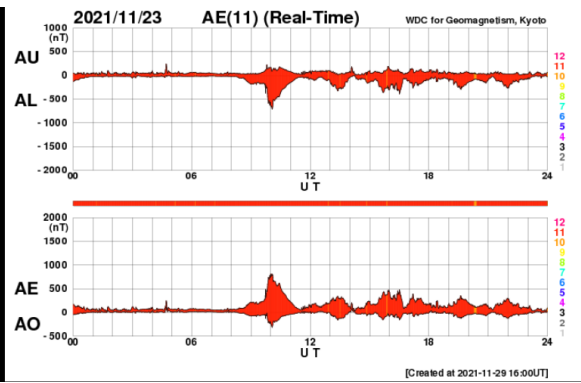
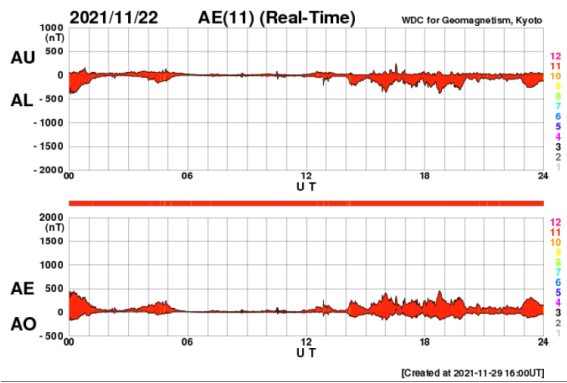
- The Dst index does not show significant variations, with a minimum of -22 nT on 11/28



- Kp Index shows a maximum of 4 on 11/28



- The auroral activity intensified from the 22nd of November, reaching 1000 nT on the 20/11



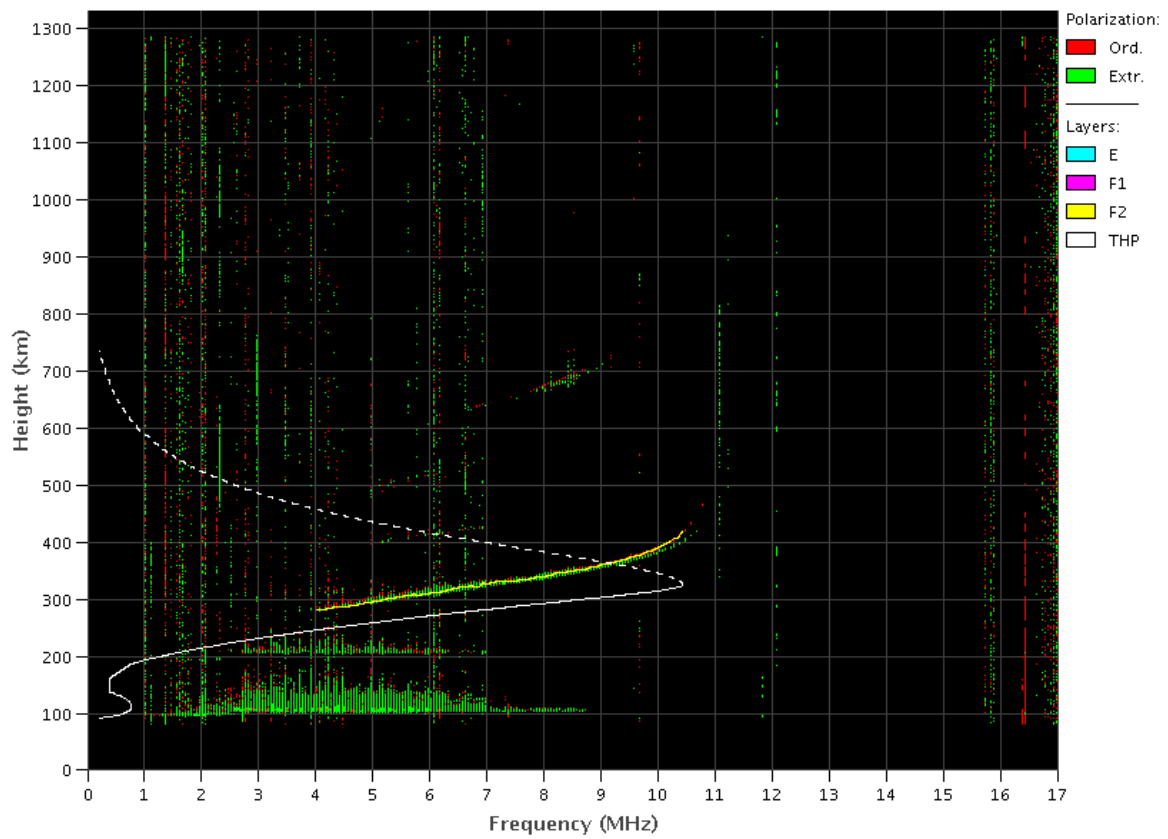
Ionosphere

Responsible: Laysa Resende

Boa Vista:

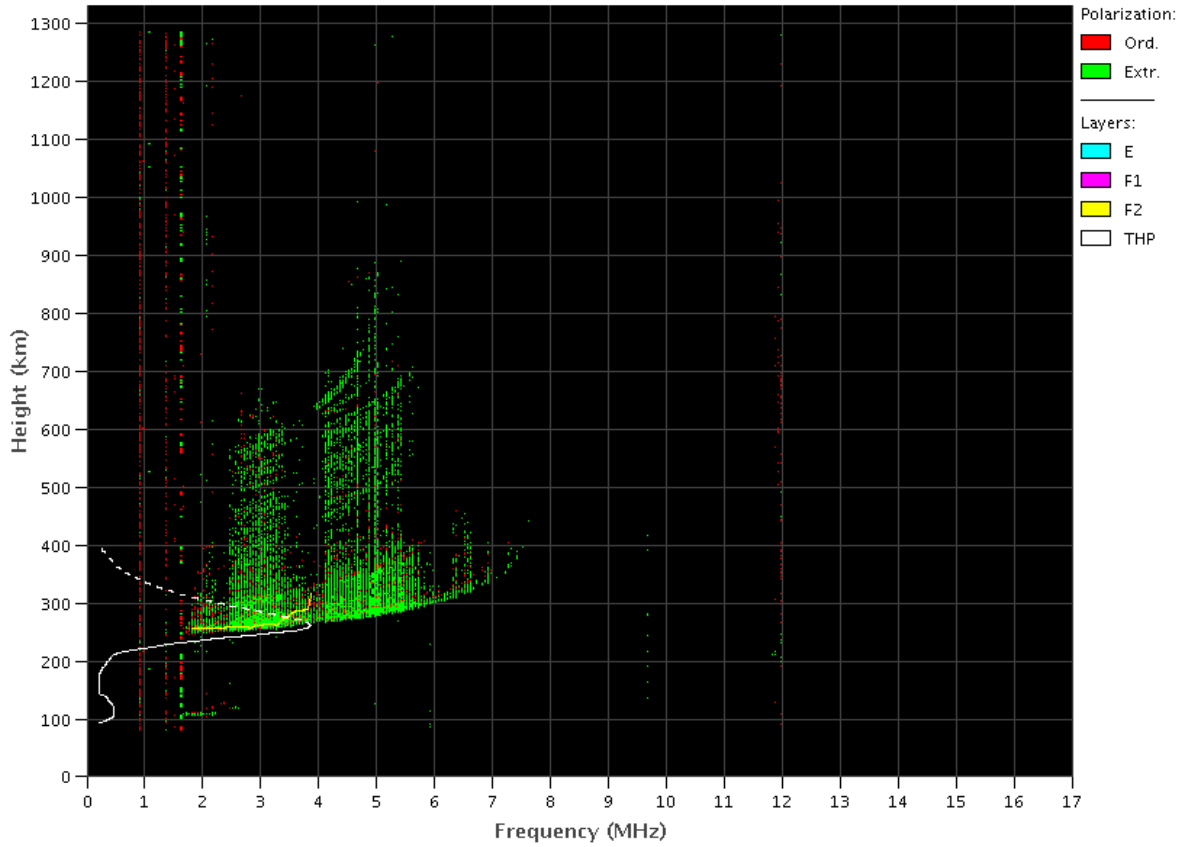
- There were spread F during all days in this week.
- The Es layers reached scale 4 on day 23.

Boa Vista - 11/23/2021 22:10:00 UT



Cachoeira Paulista:

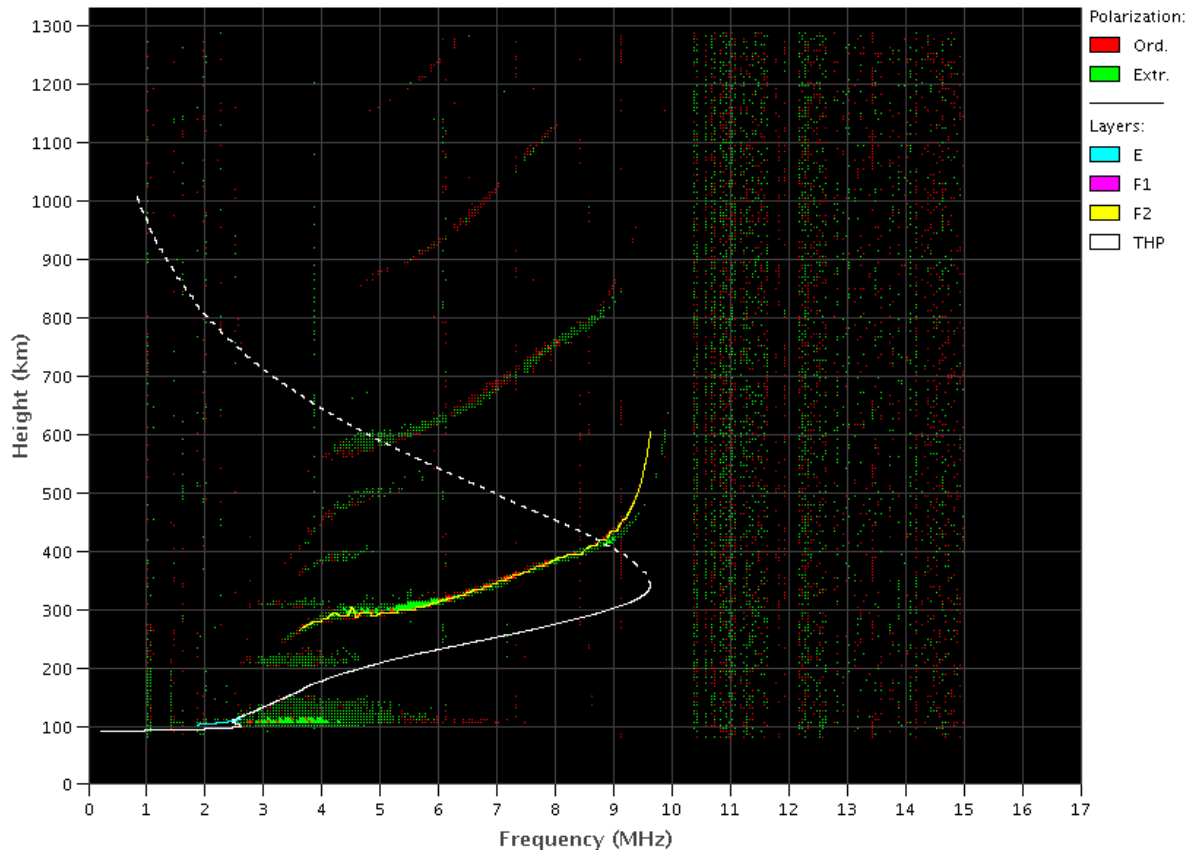
- There were spread F during all days in this week.
- The Es layers reached scale 3 on days 22, 24, and 27.



São Luís:

- There were spread F during all days in this week.
- The Es layers reached scale 4 on days 22, 26, 27, and 28.

São Luís – 11/28/2021 19:00:00 UT



Scintillation S4

Responsible: Siomel Savio Odriozola

In this report on the S4 scintillation index, data from the SLMA stations in São Luís / MA, STSN in Sinop /MT, UFBA, in Bahia / BA and SJCE in São José dos Campos / SP were presented. The S4 index tracks the presence of irregularities in the ionosphere having a spatial scale ~ 360 m.

Alike last week, the 4 receiving stations showed scintillation above 0.3 at some point in the 11/22-28/ week. This week, as shown in Figure 1, the SJCE station showed S4 values above 0.5 every day around sunset time. The day of greatest scintillation both in durability and maximum values were reached in SJCE between 23:40 UT on the 11/27 and 04:50 UT on 11/28 (Figure 2 upper panel). During this event the amplitude of the signal of several satellites (all of them between the west and northwest of the SJCE station) were affected as shown in Figure 2, lower panel.

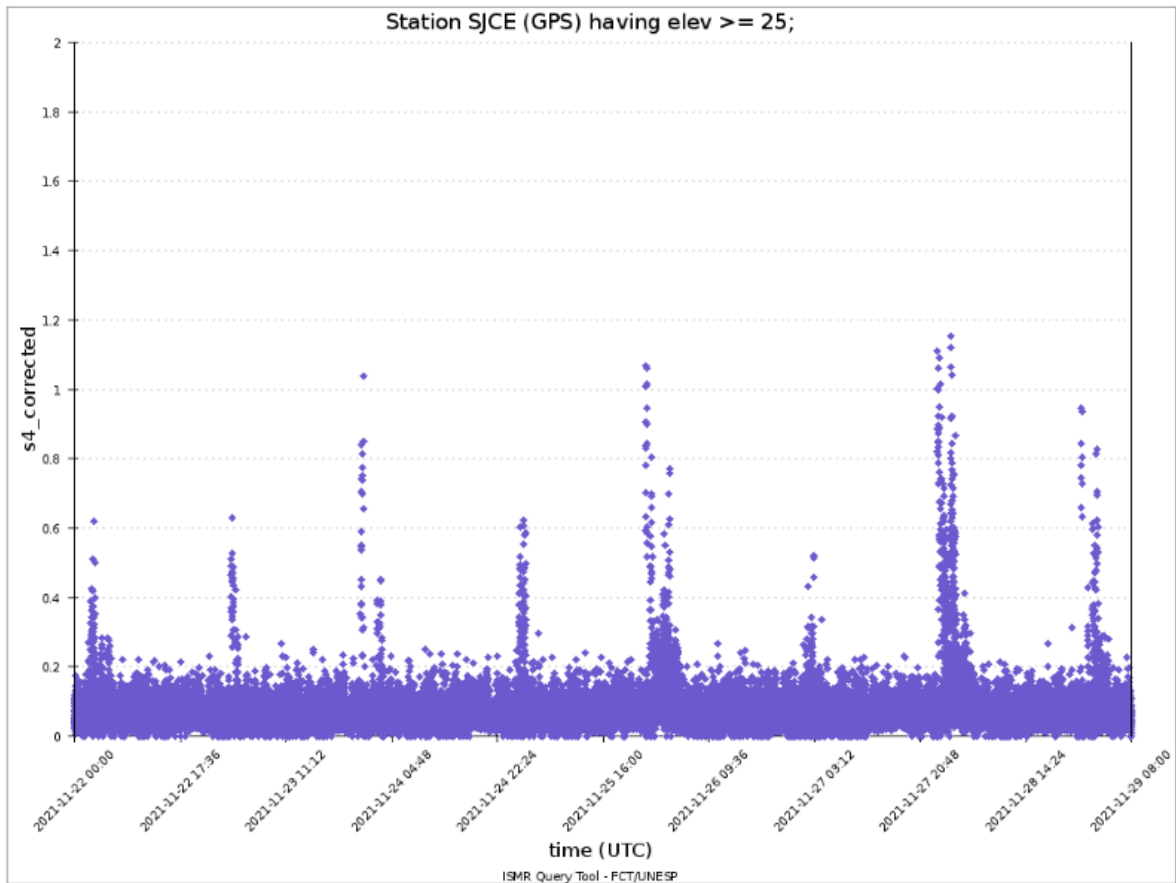


Figure 1: Values of the S4 index for the GPS constellation for SJCE station during the week between 22—28/11

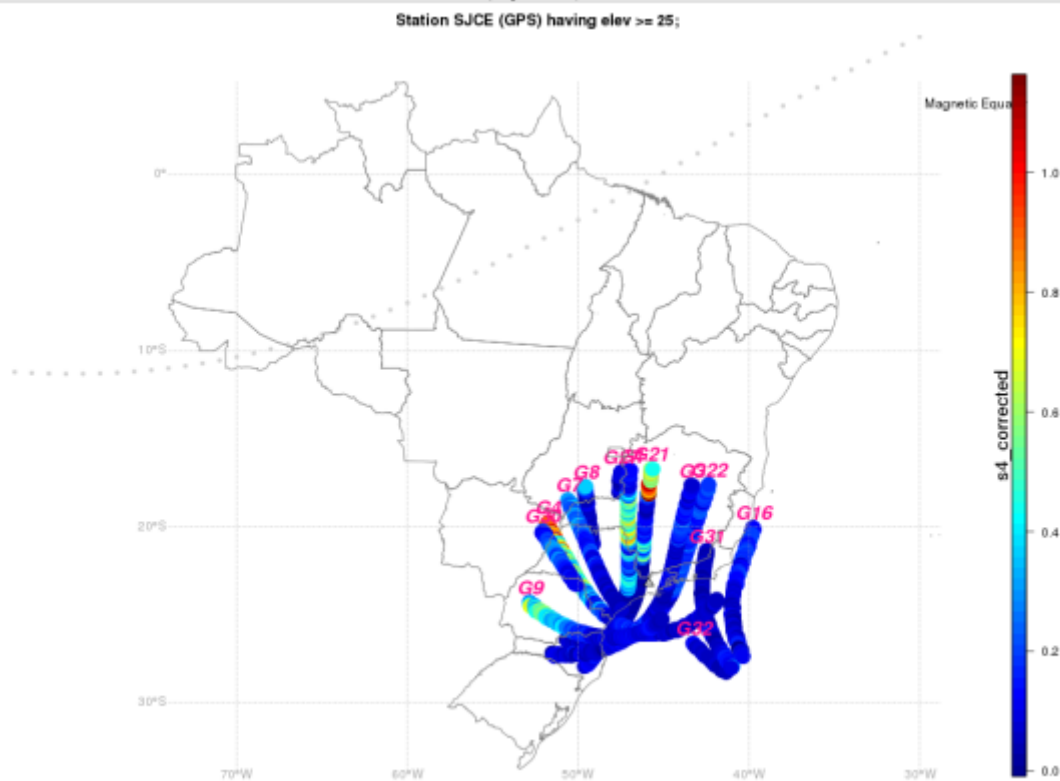
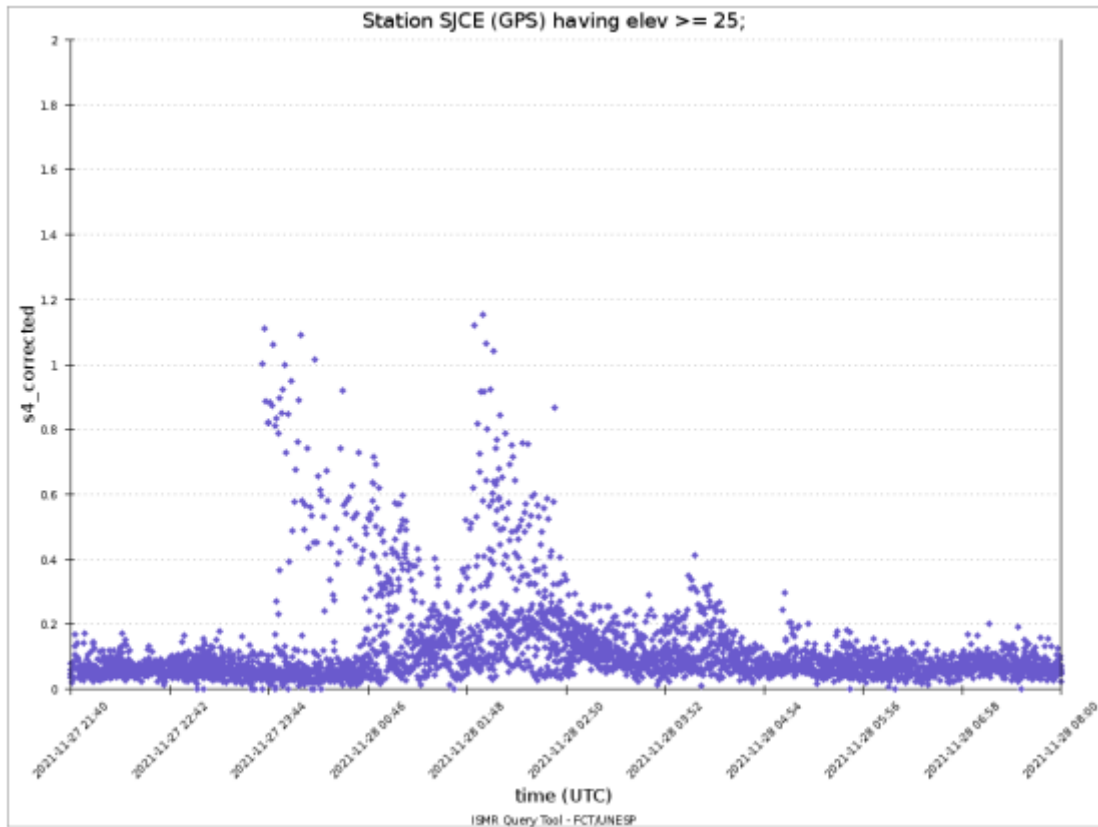


Figure 2: S4 index values for the GPS constellation measured by the SJCE station between 1840h LT on 11/27 and 05h on 11/28 (upper panel). In the lower panel appear the

map of the
S4 values for the GPS satellites in the receiver's field of view in the time interval 20h
—0150h
LT.